

Amendment and Response

Applicant: Mark Hirst et al.
Serial No.: 10/689,464
Filed: October 20, 2003
Docket No.: 200309601-1
Title: INDICATING SYSTEM

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Cancelled)
2. (Cancelled)
3. (Previously Presented) An indicating system in a device having a heat emitting member, the indicating system comprising:
a thermoelectric generator having a first surface mechanically and thermally coupled to the heat emitting member and a second surface mechanically and thermally coupled to a heat sink, the thermoelectric generator configured to convert heat from the heat emitting member to electrical energy; and
an indicating device powered by the electrical energy configured to provide indication of when a temperature level of the heat emitting member is above a temperature threshold.
4. (Cancelled)
5. (Previously Presented) An indicating system in a device having a heat emitting member, the indicating system comprising:
a Peltier device operating in a Seebeck mode and having a hot junction thermally coupled to the heat emitting member and a cold junction thermally coupled to a heat sink, the Peltier device configured to convert heat from the heat emitting member to electrical energy; and
an indicating device powered by the electrical energy configured to provide indication of when a temperature level of the heat emitting member is above a temperature threshold.

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6. (Previously Presented) The indicating system of claim 3, wherein the indicating device comprises:
 - a light emitting diode (LED).
7. (Original) The indicating system of claim 6, wherein the LED is configured to blink.
8. (Original) The indicating system of claim 7, wherein the LED is configured to blink substantially at a frequency at which human visual response is most sensitive to flicker.
9. (Previously Presented) The indicating system of claim 7, wherein the LED is configured to blink at a frequency substantially between 0.5 Hz and 15 Hz.
10. (Previously Presented) The indicating system of claim 6, wherein the indicating device further comprises:
 - a warning label adhered to the heat emitting member that is illuminated by the LED.
11. (Previously Presented) A fuser comprising:
 - a heat emitting member; and
 - an indicating system comprising:
 - a thermoelectric generator adapted to thermally couple to the heat emitting member and configured to convert heat from the heat emitting member to electrical energy; and
 - an indicating device powered by the electrical energy and configured to provide indication of a temperature level of the heat emitting member.
12. (Original) The fuser of claim 11, wherein the heat emitting member comprises:
 - a heated fuser roller.

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13. (Original) The fuser of claim 11, wherein the thermoelectric generator comprises:
a Peltier device operating in a Seebeck mode.
14. (Original) The fuser of claim 12, wherein the heated fuser roller is within a housing that absorbs heat from the heated fuser roller.
15. (Previously Presented) A fuser comprising:
a heated fused roller positioned within a housing that absorbs heat from the heated fuser roller; and
an indicating system comprising:
a Peltier device operating in a Seebeck mode and having a hot junction that is mechanically and thermally coupled to the housing and a cold junction that is mechanically and thermally coupled to a heat sink; and
an indicating device powered by the electrical energy and configured to provide indication of a temperature level of the heat emitting member.
16. (Original) The fuser of claim 11, wherein the indicating device comprises:
a light emitting diode (LED).
17. (Original) The fuser of claim 16, wherein the LED is configured to blink.
18. (Original) The fuser of claim 16, wherein the indicating device further comprises:
a warning label that is illuminated by the LED.
19. (Original) The fuser of claim 18, wherein the warning label comprises:

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a polycarbonate label configured as a light pipe such that when light from the LED shines into an edge of the label the light is distributed throughout the warning label so as to illuminate the warning label in a substantially even fashion.

20. (Original) The fuser of claim 18, wherein the warning label is coupled to the heat emitting member.

21. (Previously Presented) An imaging system comprising:

a heat emitting member; and

an indicating system comprising:

a thermoelectric generator adapted to thermally couple to the heat emitting member and configured to convert heat from the heat emitting member to electrical energy; and

an indicating device powered by the electrical energy.

22. (Original) A laser imaging system comprising:

a fuser that generates heat; and

an indicating system comprising:

a thermoelectric generator adapted to thermally couple to the fuser and configured to convert heat from the fuser to electrical energy; and

an indicating device powered by the electrical energy and configured to provide indication of a temperature level of the fuser.

23. (Previously Presented) A laser imaging system comprising:

a fuser that generates heat; and

an indicating system comprising:

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a thermoelectric generator adapted to thermally couple to the fuser and thermally coupled to a heat sink, the thermoelectric generator configured to convert heat from the fuser to electrical energy; and

an indicating device powered by the electrical energy and configured to provide indication of a temperature level of the fuser.

24. (Previously Presented) The laser imaging system of claim 22, wherein the thermoelectric generator comprises a Peltier device operating in a Seebeck mode.

25. (Original) The laser imaging system of claim 22, wherein the fuser comprises:
a heated fuser roller within a housing that absorbs and emits heat from the heated fuser roller.

26. (Previously Presented) A laser imaging system comprising:
a fuser comprising a heated fuser roller within a housing that absorbs and emits heat from the heated fuser roller ; and

an indicating system comprising:

a thermoelectric generator comprising a Peltier device operating in the Seebeck mode and having a hot junction mechanically and thermally coupled to the housing and a cold junction mechanically and thermally coupled to a heat sink, the thermoelectric generator configured to convert heat from the fuser to electrical energy; and

an indicating device powered by the electrical energy and configured to provide indication of a temperature level of the fuser.

27. (Original) The laser imaging system of claim 22, wherein the indicating device comprises:

a light emitting diode (LED).

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28. (Original) The laser imaging system of claim 27, wherein the LED is configured to blink.
29. (Original) The laser imaging system of claim 28, wherein the LED is configured to blink substantially at a frequency at which human visual response to flicker is most sensitive.
30. (Currently Amended) The laser imaging system of claim 28, wherein the LED is configured to blink at a frequency substantially between 0.5 Hz and 15 Hz.
31. (Previously Presented) The laser imaging system of claim 27, wherein the indicating device further comprises:
a warning label illuminated by the LED.
32. (Previously Presented) The laser imaging system of claim 31, wherein the warning label comprises:
a polycarbonate label configured as a light pipe such that when light from the LED shines into an edge of the warning label the light is distributed throughout the warning label so as to illuminate the warning label in a substantially even fashion.
33. (Previously Presented) The laser imaging system of claim 31, wherein the warning label is coupled to the fuser.
34. (Previously Presented) A method of indicating when a fuser is at a temperature level representing a potential burn hazard, the method comprising:
converting heat from a heat emitting member to electrical energy; and
powering an indicating device with the electrical energy so long as the electrical energy has a level above a threshold energy level.

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35. (Original) The method of claim 34, further comprising:
positioning a thermoelectric generator so as to be thermally coupled to the heat emitting member.
36. (Original) The method of claim 35, wherein the thermoelectric generator comprises a Peltier device operating in the Seebeck mode.
37. (Original) The method of claim 34, wherein the indicating device comprises a light emitting diode (LED).
38. (Original) The method of claim 37, further comprising:
configuring the LED such that LED blinks at a frequency at which human visual response to flicker is most sensitive.
39. (Original) The method of claim 38, further comprising:
positioning a polycarbonate warning label configured as a light pipe such that when light from the LED shines into an edge of the warning label the light is distributed throughout the warning label so as to illuminate the warning label in a substantially even fashion.
40. (Original) An imaging system configured to couple to a fuser that generates heat, the imaging system comprising:
a means for converting heat generated by the fuser to electrical energy; and
an indicating means powered by the electrical energy configured to provide indication of a temperature level of the fuser is at a level above a temperature threshold.